

Response to Final Office Action mailed April 29, 2009

Serial No. 10/596,334; filed June 9, 2006

Inventors: Berger et al.

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REMARKS

Claims 1, 4, 15, and 18 been amended. No claims have been cancelled and new claim 20 has been added. The amendments and new claim find support at, e.g., FIGS. 2-4, the claims, pages 12-14 of the substitute specification, and elsewhere in the application as filed, whereby no new matter is added. Claims 1-20 are pending and presented for review. Favorable reconsideration and allowance are requested in light of the remarks which follow.

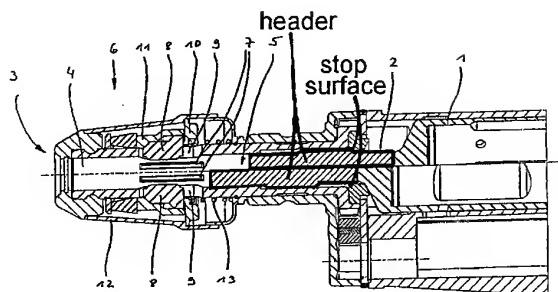
1. Prior Art Rejections

The Examiner rejects claims 1-19 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,971,403 to Yahagi et al. (herein “the Yahagi patent”) in view of U.S. Patent No. 6,510,904 to Tyrrell (herein “the Tyrrell patent”). Applicants respectfully assert the amendments herein obviate all such rejections because, as is discussed below, the Yahagi and Tyrrell patents, alone or combined with each other, do not and cannot disclose or suggest each and every element of amended claim 1. Therefore, reconsideration is in order and is respectfully requested.

a. Recapitulation of the Invention*

The invention relates to a drilling and/or percussive hammer having a tool holder for holding a tool and transferring a torque to the tool. The tool holder or receptacle has a stationary stop surface and an impact opening that are spatially arranged with respect to each other to enhance force transmission between an impact piston, or other percussive hammer components, and the tool. Prior art percussive hammer tool receptacles incorporate an intermediate structure, typically referred to as a header or striker (see, e.g., reference character 2 in FIG. 1 of the present application), which is axially upstream of the tool for (i) transmitting impact energy from an impact piston, and (ii) axially positioning the insertion end of the tool.

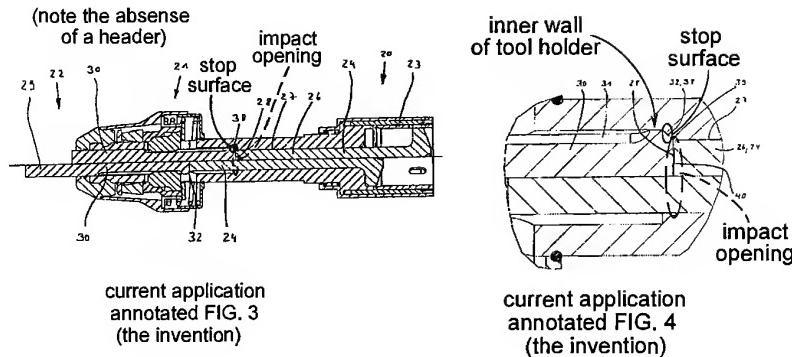
* This Section 1(a) is presented for background purposes so the Examiner may understand the state of the art and, in general terms, the Applicants' contribution thereto. It is not intended to particularly address the obviation of any particular rejection. That task instead is performed in Section 1(b) below.



current application
annotated FIG. 1
(prior art)

In other words, such prior art headers or strikers transfer impact forces from an impact piston, or other percussion mechanism, to the tool and also axially limit an amount that a tool can travel into a device. The typical prior art header (or striker) thus limits axial travel of the tool because its own axial travel is limited by, e.g., a mechanical stop located somewhere within the device, typically of the header or at an end that is furthest from the tool. Accordingly, in such known configurations, any stop structure or surface must be provided at a location within a percussive hammer that is axially spaced from a location where the tool is impacted, e.g., the stop surface is spaced from an impact opening. The stop structure and impact (opening) locations are typically spaced from each other by a distance that corresponds to the header's length dimension. Length, width, and/or other related space requirements of headers influence and can greatly limit design possibilities for the impact pistons that cooperate with the headers, which can make achieving relatively greater impact energies by way of impact piston design difficult.

In the present invention, a tool receptacle includes a stop surface provided on an inner wall of the tool holder. The stop surface is located in the area of the impact opening, acting in the axial direction of the tool holder *to limit axial travel of the tool into the tool holder when an end surface of the tool abuts the stop surface*. Such spatial relationship between the stop surface and impact opening allow the tool's axial travel to be axially limited at its impact position which mitigates feedback effects that are known to influence percussive systems.



b. Obviation of Rejections

Applicants respectfully traverse the above-referenced rejections and assert that the combination of the Yahagi and Tyrrell patents do not and cannot render obvious a device for a drilling and/or percussive hammer having a tool receptacle that includes an inner wall of a tool holder with *a stop surface that limits axial travel of the tool into the tool holder when an end surface of the tool abuts the stop surface.*

Independent claims 1, 15, and 18 are directed toward drilling and/or percussive hammers having tool receptacles for holding and a transmitting torque to tools. Each tool receptacle includes an essentially hollow cylindrical recess, forming the tool holder. One end of the tool holder includes an introduction opening through which an insertion end of the tool can be introduced and an opposing end has an impact opening through which an impact action can be applied to *an end surface of an insertion end of the tool*. An inner wall of the tool holder includes *a stop surface that limits axial travel of the tool into the tool holder when the end surface of the tool abuts the stop surface.*

The Yahagi patent discloses a tool bit holder having a tool release mechanism that is configured to allegedly resolve various issues relating to non-desired tool removal. As is conventional, the tool of Yahagi has its travel limited by contacting a (header) striker 15, whereby Yahagi provides no supplemental travel limiter *for the tool*, by way of the tool holder, in any regard.

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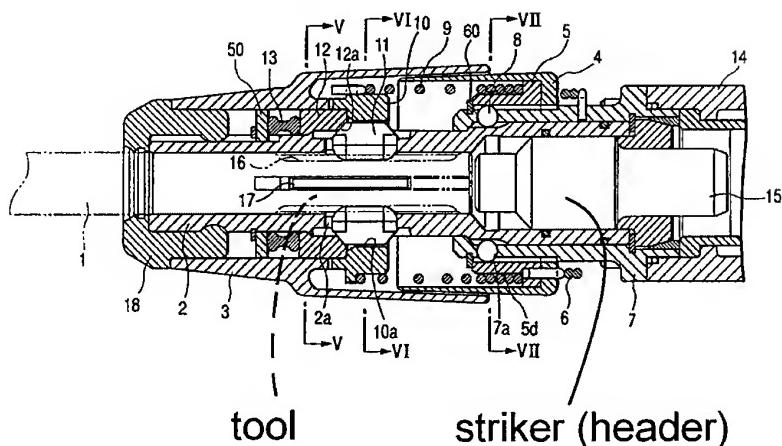
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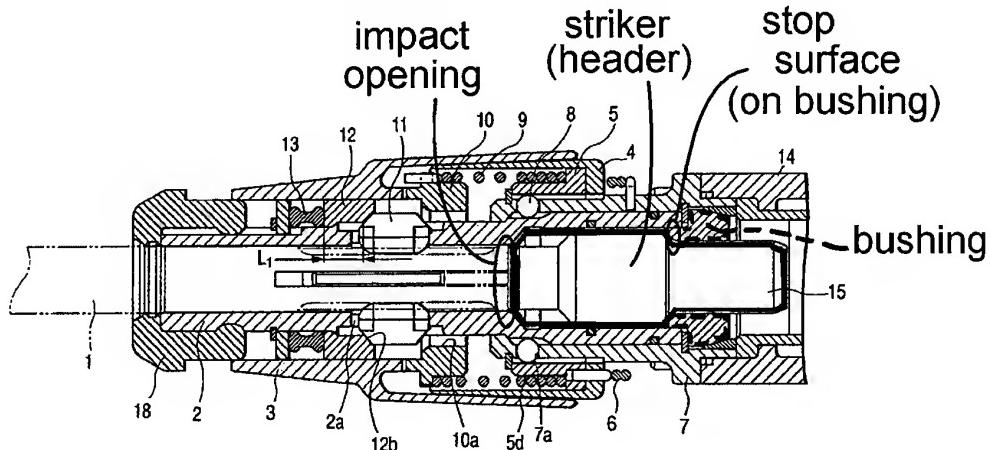
Yahagi, FIG. 1 (annotated)

FIG. 1



Instead of providing a travel limiting structure for the tool, Yahagi discloses a travel limiting structure for the *striker* (header) – upstream of and spaced from the tool.

Yahagi, FIG. 2 (annotated)



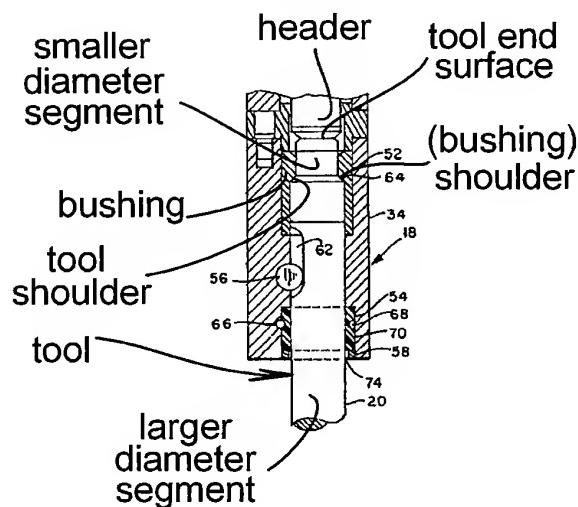
Accordingly, Yahagi does not disclose or otherwise teach or suggest a stop surface that limits axial travel of the tool into the tool holder when an end surface of the tool abuts the stop

surface. Instead, Yahagi discloses a stop surface that stops limits axial travel of the tool into the tool holder when (i) the header abuts the stop surface, and (ii) the tool abuts the header.

The Tyrrell patent discloses a tool bit holder having a supplemental travel limiter for a tool in the form of a shoulder 64 that extends inwardly from a bushing 52, about midway along the length of the bushing 52 (Column 1, Lines 36-39 and FIGS. 1 – 2). Due to the configuration of the (mid-placed) bushing shoulder 64, Tyrrell correspondingly discloses a tool having a uniquely configured top portion that has a smaller diameter, stepped-down, segment.

A tool shoulder is defined between the larger diameter segment and the smaller diameter segment. When the tool shoulder abuts the bushing shoulder 64 of bushing 52, the bushing shoulder 64 restrains further movement of the tool into the holder by providing an annular mechanical stopping interface. A distance between an end surface of the tool and the tool shoulder corresponds to (and is greater than) a distance between the bushing shoulder 64 and the end of bushing 52. This allows the tool end surface to pass sufficiently far into a header guide so that it can be contacted by the header, before the tool shoulder abuts the bushing shoulder. Stated another way, the tool shoulder and the bushing shoulder 64 are purposefully axially spaced from an impact area in a manner that allows the tool end surface to be properly located for being impacted by the Tyrrell header.

Tyrrell, FIG. 2 (annotated)



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Accordingly, Tyrrell does not disclose or otherwise teach or suggest *a stop surface that limits axial travel of the tool into the tool holder when an end surface of the tool abuts the stop surface*. Instead, Tyrrell discloses **a stop surface that limits axial travel of the tool into the tool holder when a tool shoulder abuts a bushing shoulder and the tool end surface abuts the header**. Therefore, it is believed that each of independent claims 1, 15, and 18 is allowable over the cited prior art.

Nor do the Yahagi and Tyrrell patents, or either one individually, disclose or render obvious each and every limitation of claims 2-14, 16-17, or 19, whereby these claims are allowable as depending from allowable claim 1, directly or indirectly, as well as on their own merits.

For instance, claim 12 further recites that a diameter of the shaft of the impact piston, or of an impact element that transmits the impact energy of the impact piston to the insertion end, is smaller than the inner diameter of the introductory beveling, having the shape of a truncated cone, of the insertion end, which is not taught or suggested by any of the cited references.

New Claim and Conclusions

New claim 20 is directed generally toward the subject matter of claim 4 and recites that the tool end surface includes a beveled portion that contacts the stop surface and a planar portion that is contacted by the impact piston

Applicants assert that claims 1-20 are in compliance with 35 U.S.C. § 103 and each defines patentable subject matter. A Notice of Allowance is therefore respectfully requested. A fee in the amount of \$940 is believed due for a one month extension (\$130 large entity) and Request for Continued Examination (\$810 large entity). The Director is authorized to direct payment of such \$940 fees to Deposit Account No. 50-1170. No other fees are believed due at this time. Nevertheless, should the Examiner consider any fees to be payable in conjunction with

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this or any future communication, the Director is authorized to direct payment of such fees, or credit any overpayment, to Deposit Account No. 50-1170.

Respectfully submitted,



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